Weekly Report for 11/18/2013

Highlights

• Reviewed papers from CERN & ESRF relating to NEG-coated chambers and prepared a list of comments and questions relating to the MBA Upgrade. (Kathy Harkay)

• Analyzed recent beam dumps and SCU0 recovery for operations. (Kathy Harkay)

APS Renewal and Upgrade

• Development of APS upgrade MBA lattice, in particular on MOGA optimization of plain-6BA lattice, linear optics optimization on Hybrid-6BA lattice & Hybrid-7BA lattice without longitudinal gradient dipoles. (Yipeng Sun)

• Reviewed papers from CERN & ESRF relating to NEG-coated chambers and prepared a list of comments and questions relating to the MBA Upgrade for Herman Cease for his site visits the week of 11/18. (Kathy Harkay)

• Calculated what the resistive-wall heating for the 6-mm ID chambers would be for the MBA Upgrade. (Kathy Harkay)

• MBA injection design: continue the simulation work; gave a report on recent simulation result; discuss Q1/Q2 field map with M. Jaski; summarized injection parameters and injected beam trajectory coordinates. Performed rough DA calculation for optics with longer (6.8m) straight section and presented results to the MBA physics group meeting. (Aimin Xiao)

• Started simulation of high coupling optics issues. (Aimin Xiao)

• Re-planning the RIXS undulators in case DOE approves that we can proceed. The RIXS beamline has been on hold since August. We are spending more time and effort re-planning and doing EVMS now that it's on hold than we had to do while we were allowed to do it. :((Marion White)

• I had to miss the injector meeting so CY hosted it. Thank you, CY. (Marion White)

• Completed the second impedance databse whose results were presented at the next generation light source meeting. Summary includes the kick tables of individual and total impedance budget, where the critical items were identified. The design updates of kicker, bpm, gatevalve were received and the optimization was continud for small impedance. The gatevalve liner needs special attention for a possbile HOM heating. This is under investigation in collaboration with X. Sun (Yong Chul Chae)

• Worked on trajectory/orbit correction for H7BA lattice. Increased initial BPM errors to take initial offset errors nto account. Also changed correction procedure. (Vadim Sajaev)

MCR Operations

Storage Ring Operations

• Analyzed recent beam dumps and SCU0 recovery with Marty Smith. Noted some anomolies in the recorded activity logs recently updated to include the SCU0. (Kathy Harkay)

• Set up RHB lattice with 5-mm horizontal bump in ID 28. Corrected beta functions, adjusted P0 feedback. (Vadim Sajaev)

• Involved in the discussion of PAR rf12 timing change and consequences to SR bpm timing. My conclusion: there should be none (Louis Emery)

ITS Operations

• Interviewed personnel from Radia Beam Corp about the use of our Injector Test Stand. RadiaBeam

Technologies manufactures particle accelerator components, diagnostics and turnkey accelerator systems as well as terahertz optics and detectors. Radia Beam would like to use our Injector Test Stand for Low-energy, non-FEL schemes for THz radiation. (Stan Pasky)

• I will (along with others) help Radia setup and operate their experiment. This effort will take approx. 6 months. (Stan Pasky)

Training

• Started training the new operator n general procedures and LOTO. (Randy Flood)

MCR Operations administrative/misc.

• Got new operator accounts set up and set his area of the operators' room (Randy Flood)

• Reviewed operators' daily effort confirmation sheets (Randy Flood)

• Approved operators' time cards (Randy Flood)

• Approved vacation requests, set up coverage and updated the online schedule (Randy Flood)

• Approve CTLs, IT and Other work requests (Randy Flood)

• Review and clean the asdops mail account at least twice (Randy Flood)

• Check the status of open RMD's (Randy Flood)

APS Machine Studies

Storage Ring Studies

• Conducted beam steering studies in the SCU0 to quantify the cryocooler performance with 100 mA in 24 bunches. Discussed the data with Chuck Doose. (Kathy Harkay)

• Together with C.-X. Wang performed experimental comparison of lattice correction using turn-by-turn (TBT) data (program by C.-X. Wang) and using response matrix (RM) fit (our standard optics correction). TBT optics correction is about twice as fast but not as accurate as RM correction. Will continue working on it. (Vadim Sajaev)

• Improving injection optimization programs: worked on on-axis injection optimization using first-turn trajectory. It works faster than usually used simplex minimization. (Vadim Sajaev)

• Led Machine Physics meetings, and gave presentation on investigations to increase the SR on-axis efficiency (i.e. Booster septum aperture scan and BTS trajectory scan). (Louis Emery)

Linac Studies

• Over the last month the linac thermionic RFGun known as RG2 has had so difficulties. The reflected power has been increasing as a result of the water system that hold this gun in tune. Long store short. We determined the pump motor or related assembly (prop)was not providing the correct flow of water through the gun to maintain temperature. As of 11/19/2013 the MOM Group (Rob Wright and John Dench) replaced the whole assemble. As a result the system is back to normal and the gun tune has improved. (Stan Pasky)

ITS Studies

• Coordinating all efforts in the Injector Test Stand for commissioning a new Photo cathode RF Gun. Yine and myself are organizing a commissioning plan known as "The Photo-Cathode Gun High

Power RF,Conditioning Readiness at the Injector Test Stand". (Stan Pasky)

APS Machine Research and Development

Storage Ring Research and Development

• Met with J. Dooling and C. Doose to review what would be required to install beam loss monitors (fibers) at the SCU0. (Kathy Harkay)

• Ran scraper simulations with 24-bunch loss pattern. (Jeff Dooling)

• Developed scripts for data analysis. (Jeff Dooling)

• Provided J. Liu (AES-MED) with static dose distributions for input to ANSYS. (Jeff Dooling)

• Once this is done will try dynamic distributions according to Pass number in the elegant loss distribution file. (Jeff Dooling)

• Managed the scraper upgrade project whose activity included 1) to select mechanical engineering design of Ti-Cu-SS whose interface can be brazed 2) to form a taks team to study the diffusion during beam loss headed by J. Dooling 3) to form a task team for HOM heating headed by G. Waldschmidt (Yong Chul Chae)

• Reviewed air bag model in A. Chao's textbook and that of concentric air bag model of A. Burav. (Louis Emery)

Booster Research and Development

• Continued the collaboration with C. Yao to interprete and set the impedance model of booster for high charge injection (Yong Chul Chae)

PAR Research and Development

• Harmonic Par System - We will be changing the Harm main screen during the Dec./Jan shutdown to make it easier to use for operators (& everyone). I have asked Terry to give the operators a list of general instructions on how to handle that screen, primarily the changes. The changes are the following: (Stan Pasky)

• 1) The Cir Fwd, Cir Refl, & Cir Load Fwd will be made bigger (like Fwd Pwr is now) & moved to the top of the screen. Everyone will use Cir Refl from this point on to observe refl power when adjusting tuner current. The reason to keep the Cir Load Fwd directly under the Cir Refl is so everyone can become familiar with and easily monitor that these two values are always equal, which indicates that the circulator and circulator load are working correctly. (Stan Pasky)

• 2) The Fwd Pwr & Refl Pwr now on the screen will be re-labeled to Tube Fwd & Tube Refl & moved lower. The tube Refl is currently set to turn RF off at 500W, we will change this to 100W. The tube Refl is currently reading 0W under all conditions and will always to so if the circulator & Load are working correctly. This will be used primarily by RF Group for evaluation, not by Ops. (Stan Pasky)

• 3) Fast RF & Slow RF resets will be moved closer to the indicators & various other changes etc. (Stan Pasky)

• Discussed wtih Yao about removing the contribution of fundamental mode from wake potential of cavity, (Louis Emery)

Linac Research and Development

• Continued to work on the PC Gun laser, now concentrating on uv output. By weeks end had

obtained 140 microJoules of uv. (Jeff Dooling)

• Goal is to get to 250 microJoules of uv, but can begin experiments at 100 microJoules. (Jeff Dooling)

• Was able to reduce the diode pump current to 185 A while keeping good energy levels out of the regen (4.5 mJ per pulse). (Jeff Dooling)

• Drafted a schedule with Y. Sun and W. Berg for pcgun laser work in the ITS over the next two months. (Jeff Dooling)

• Attended PIP and TCAV/PCGun meetings. Discussed status and schedule of pc gun laser work. (Jeff Dooling)

• Need a spare SLED for the Linac - A sit stands we have two SLEDs that were built by IHEP (Institute of High Energy Physics), Chinese Academy of Sciences in Beijing China. They were installed in our L6 test stand to condition and the SLED immediately contaminated the test stand. The L6 waveguide was removed and cleaned by the vacuum group and was reassembled. The SLED was then baked by the vacuum group for 1 to 2 weeks. After the baking ITerry Smith attempted to condition again and the L6 test stand once again got contaminated. That was the last time anything was done with either of the Chinese SLEDs. It was suggested that a higher temp bake may be necessary & to avoid a temp change across the ceramic couplers, the entire SLED will need to fit into an oven. Come to find out from SLAC they have a facility for baking at a cost of $7400. Also attempting to get purchase a production SLED that is not in service from SLAC. (Stan Pasky)

ITS Research and Development

• Attended seminar given by A. Smirnov (RadiaBeam) on generation of THz radiation with thermionic rf guns. (Jeff Dooling)

• Met with Smirnov and APS staff to discuss a proposed THz experiment for RadiaBeam in the ITS. (Jeff Dooling)

APS Machine Software

AOP Applications Software

• Submitted ibsEmittance calculation to SVN. New code includes inputs of equilibrium beam parameters. (Aimin Xiao)

• Asked Shang to fix some aspect of OAG application menu and ExperimentDesigner. (Louis Emery)

• Discussed changing BPLD steering limit calculations with Schroeder and Shang. (Louis Emery)

• Helped Shang debug a bpm status value in orbit correction configuration. (Louis Emery)

• Met with group to revise the SR study workspace setup. (Louis Emery)

• Updated the xBTS matrix measurement pem. Improved (Louis Emery)

• script that takes hp9000 scope data. (Louis Emery)

Storage Ring

• debugged why the S35B:P1 y was complained to be out of BPLD trip limit, it was because that SRIDSteering compares the setpoint with the BPLD trip limits instead of the raw BPM value which is used in BPLD trip alarm. Therefore, changed to use bpm raw values in SRIDSteering (which is offset+setpoint) instead of setpoint to check with the BPLD trip limits because BPLD uses bpm raw

values. Installed SRIDSteering. (Hairong Shang)

• added mux displays for HP9000 scope to ScopeSaveRestore (Hairong Shang)

• Added "Restore System Config" button to collectFPGAdata to be able to restore the FPGA waveform settings after collecting data. (Hairong Shang)

• The SR steering configuration runs slow, debugged SRConfig.tcl to try to find out the costy parts, not done yet. (Hairong Shang)

General

• made the missing SR H/V corrector status and SR pem menu show-up in OAGapps gnome menu, they were missing because of filename errors and desktop file error for SR pem. (Hairong Shang)

IOC/EPICS/Controls/Linux/Solaris/Linux Clusters/Data Loggers/Simulation software

• Administer the EPICS CVS repository to ensure current versions are installed and conflicts are tracked down and eliminated. (Randy Flood)

Publications, papers and report

• Yipeng Sun, 83 pm Hybrid Seven-Bend Achromat Lattice without Gradient Dipoles for APS Upgrade, AOP-TN-2013-068. (Yipeng Sun)

• Reviewed referee comments on PNNL/ANL/IIT paper and began to work on a response. (Kathy Harkay)

• Updated SCU0 paper being prepared for journal submission: replaced several figures and revised the text mainly in Section 5 (commissioning and performance). Discussed thermal model with Yury I. and others. (Kathy Harkay)

Meetings, workshops, conferences, committees, LMS related, and reviews

• Studies on APS upgrade lattice design, Yipeng Sun, seminar on AOP physics meeting 2013-11-14. (Yipeng Sun)

• Attended MBA physics meeting. Scored 19 ANL Named Postdoc applications. (Louis Emery)

Education, Mentoring and outreach

• study Python from online course to look at the possibility of writing gnome panel for displaying APS status PVs such as storage ring current. (Hairong Shang)

LCLS

• Coordination. Many meetings. Getting information to people, understanding what the technical issues are with the vacuum chamber and helping get them sorted them out so we can contribute strongly to the CD-I review December 9-11. Also following up green sheets and cost codes since some money arrived. (Marion White)

Safety and Required Training

• Completed EM116 training, Emergency Management and Continuity General Awareness. (Jeff Dooling)

Miscellaneous

• Submitted review an NSF CAREER proposal. (Kathy Harkay)

• PA Input (Marion White)

• Review Notebooks that I wrote while visiting Pohang Light Source. Looked for and found Haissinski's original paper. (Louis Emery)

• Gave latex help to several people and installed a latex package found by Harkay to make inset figures (Louis Emery)